GEOGRAPHIC SCHOOL BULLETINS

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(The National Geographic Society is a scientific and educational Society, wholly altruistic, incorporated as a non-commercial institution for the increase of geographic knowledge and its popular diffusion. General Headquarters, Washington, D. C.)

Contents for Week of October 5, 1942. Vol. XXI. No. 13.

1. The Solomon Islands, Where Marines and Japs Clash
2. Why Is Scrap Metal Necessary?
3. Egypt: An Innocent Bystander Embroiled
4. Russian Oil, Magnet of the Caucasus
5. Geo-Graphic Brevities

Note: This is the first of the GEOGRAPHIC SCHOOL BULLETINS for the school year 1942-43. No BULLETINS were issued during the summer. See BULLETINS No. 1 and No. 3 for announcements.

Official War Photograph

INDIANS DEFEND EMBATTLED EGYPT WHILE EGYPTIANS REMAIN AT PEACE

Modern warriors, like Caesar and Napoleon of old, take time out from fighting to go sightseeing in Egypt. These three soldiers from India, quite at home in Cairo's dry summer heat of 95 degrees, hear a white-robed Egyptian dragoman tell about the 70-foot-high, broken-nosed Sphinx, hewn from living rock more than 5,000 years ago. West of the Sphinx stand the three Pyramids of Giza. The largest was built of 2,300,000 stones (averaging 2½ tons in weight) to be the tomb of King Cheops about 4,600 years ago. These ancient structures are well-known trademarks of the land that cradled the first nation in history (Bulletin No. 3).

HOW TEACHERS MAY OBTAIN THE BULLETINS

The Geographic School Bulletins are published weekly throughout the school year (thirty issues) and will be mailed to teachers in the United States and its possessions for one year upon receipt of 25 cents (stamps or money order); in Canada, 50 cents. Entered as second-class matter, Jan. 27, 1922, Post Office, Washington, D. C., under act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103, Act of Oct. 3, 1917, authorized Feb. 9, 1922. Copyright, 1942, by National Geographic Society, Washington, D. C. International copyright secured. All rights reserved. Quedan reservados todos los derechos.

UMI

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)
General Headquarters, Washington, D. C.

The Solomon Islands, Where Marines and Japs Clash

A NEW chapter in American history has opened in the far Pacific, where the Solomon Islands went down on the record as the scene of the first land attack launched by U. S. forces in the present war. Japanese occupied these British-governed green islands early in the war, but on a cloudy August morning the largest landing forces of the U. S. Marines yet used began their historic battle to take and hold the tropical island bases three airplane-hours east of New Guinea. For the first time, Japan's Rising Sun flag was replaced by the Stars and Stripes.

The 900-mile-long double string of volcanic Solomons, peopled by dark-skinned Melanesians, were obscure and placid South Sea jungle islands, unfortified and unimportant, that the war took completely by surprise. Tulagi, the small-town capital of the group, had no streets suitable for wheels. All the native traffic had been by foot over inland mountains or by boat around coral-fringed shores, often by swift shell-trimmed canoes with gondolalike prows (illustration, next page).

Ex-Head-Hunters Hunt with Bone-Tipped Arrows

The 150,000 dark brown Solomon Islanders, some of them formerly head-hunters and cannibals, lived in the bow-and-arrow age when bombs brought the harder-hitting 20th century. Yet for long they commanded respect for their ability to convert an intruding white man into a pincushion full of arrows. The warrior protected his left forearm from the sting of his bowstring with spiraling coils of a vine, tight as a steel spring. Arrowheads were tipped with human bone.

Head-hunters in recent years have been finding their barbarous raids too dangerous in the face of prompt punishment. Human skulls as household decorations are beginning to be regarded a little as antiques by the younger generation.

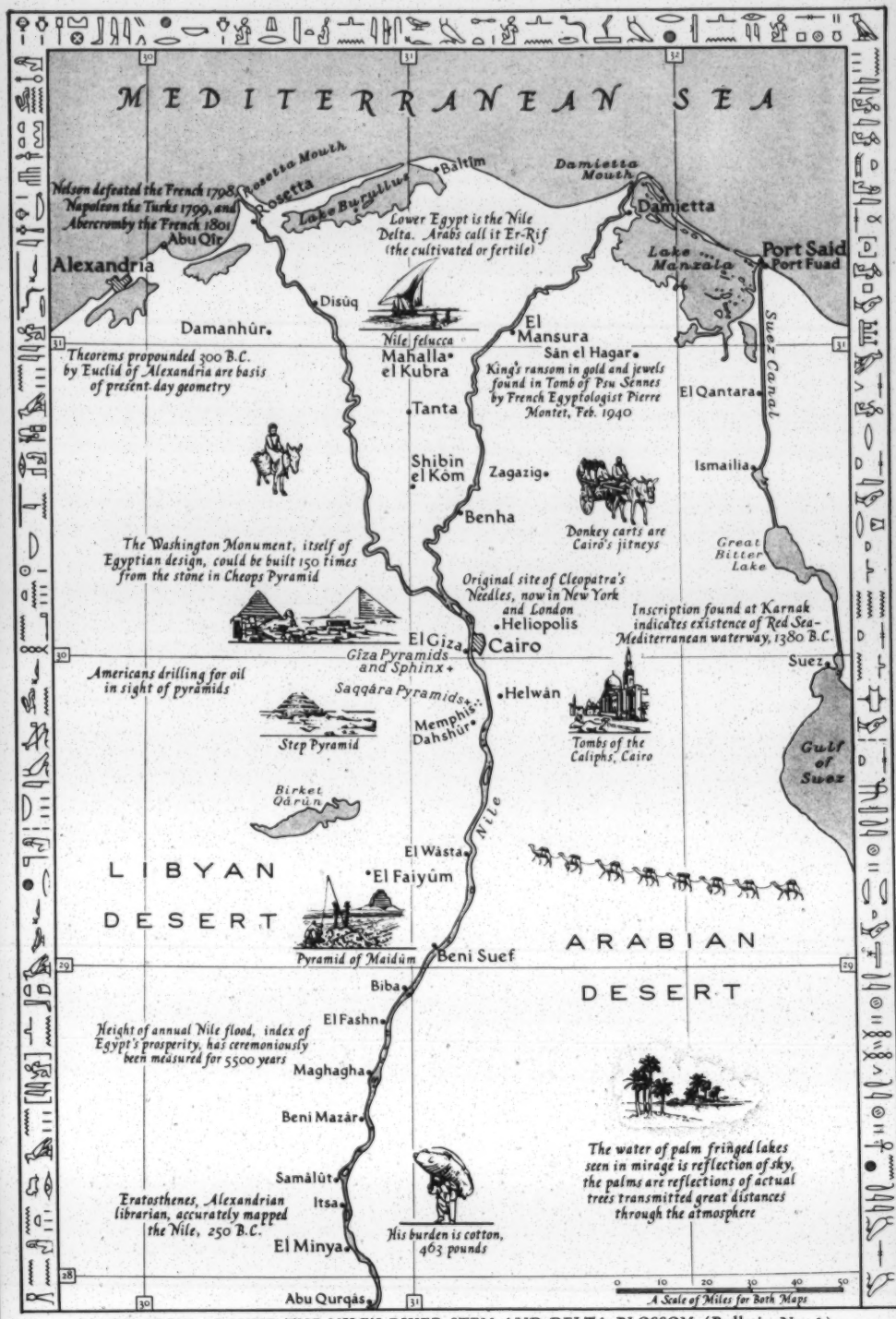
With the end of head-hunting raids, the dark islanders have been free to give more time to raising crops for food, and cannibalism has waned. Tribesmen live by spearing fish in cold mountain streams, clearing hot jungle patches for gardens of yams and pumpkins, and digging brown eggs of the sand hen along the beaches. A few, for pay in silver shillings and red calico, leave their bamboo-built tribal villages and work for two homesick years in the coconut plantations of Guadalcanal, Santa Isabel, and Gizo, to swell the exports of copra.

The earthquake-shaken Solomon Islands lie directly in the path of the South Pacific war, stretching from New Guinea toward the New Hebrides, across the northern entrance to the Coral Sea and to Australia's busy east coast. They are a five hours' bomber flight from Australia. The narrow oval of this volcanic chain, enclosing a lakelike expanse of blue South Pacific, consists of ten large forested islands, fourteen smaller ones, and uncounted islets and atolls.

Forested Bougainville on the northwest, 120 miles long, is the largest, named for the French mariner who rediscovered the group in 1768 after it had been "lost"

NOTICE: SUBSCRIBERS WHO RECEIVE A RENEWAL BLANK WITH THIS ISSUE of the GEOGRAPHIC SCHOOL BULLETINS are notified that their subscriptions expire with this issue. It is not always possible to supply back issues of the BULLETINS, and it is therefore recommended that subscribers promptly request renewal in order to be sure of a complete file.

UMI


MEDITERRANEAN SEA
Nelson defeated the French 1798, Napoleon the Turks 1799, and Abercromby the French 1801
Rosetta Mouth
Rosetta
Baltim
Damietta Mouth
Damietta
Lake Burullus
Lower Egypt is the Nile Delta. Arabs call it Er-Rif (the cultivated or fertile)
Abu Qir
Alexandria
Lake Manzala
Port Said
Port Fuad
Disûq
Damanhûr
Nile felucca
El Mansura
Mahalla el Kubra
Sân el Hagar
Theorems propounded 300 B.C. by Euclid of Alexandria are basis of present-day geometry
King's ransom in gold and jewels found in Tomb of Psu Sennes by French Egyptologist Pierre Montet, Feb. 1940
El Qantara
Suez Canal
Tanta
Shibin el Kôm
Zagazig
Ismailia
Benha
Donkey carts are Cairo's jitneys
The Washington Monument, itself of Egyptian design, could be built 150 times from the stone in Cheops Pyramid
Great Bitter Lake
Original site of Cleopatra's Needles, now in New York and London
Heliopolis
Inscription found at Karnak indicates existence of Red Sea-Mediterranean waterway, 1380 B.C.
El Giza
Cairo
Suez
Giza Pyramids and Sphinx
Americans drilling for oil in sight of pyramids
Saqqâra Pyramids
Helwân
Memphis
Dahshûr
Step Pyramid
Tombs of the Caliphs, Cairo
Gulf of Suez
Birket Qârûn
Nile
El Wâsta
El Faiyûm
LIBYAN DESERT
ARABIAN DESERT
Pyramid of Maidûm
Beni Suef
Biba
El Fashn
Height of annual Nile flood, index of Egypt's prosperity, has ceremoniously been measured for 5500 years
Maghagha
Beni Mazâr
Samâlût
Eratosthenes, Alexandrian librarian, accurately mapped the Nile, 250 B.C.
Itsa
El Minya
His burden is cotton, 463 pounds
The water of palm fringed lakes seen in mirage is reflection of sky, the palms are reflections of actual trees transmitted great distances through the atmosphere
Abu Qurqâs
0 10 20 30 40 50
A Scale of Miles for Both Maps

EGYPT GREW AROUND THE NILE'S RIVER STEM AND DELTA BLOSSOM (Bulletin No. 3).

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Why Is Scrap Metal Necessary?

SCHOOL children now "getting in the scrap" to help the National Salvage Program, launched on October 5, can learn a patriotic new branch of mathematics—salvage arithmetic.

1 old radiator = 17 rifles
½ pound fragment of broken metal = 1 hand grenade
1 old flatiron = 2 steel helmets
12½ pounds of scrap metal = 1 machine gun

When the school scrap-metal pile contains 55½ pounds, it can enter into the 111 pounds of steel needed to make a cannon for an airplane. If an old wrecked jalopy now rusting beside the highway can be salvaged, its 1,500 pounds of scrap steel will be three-fourths of the amount necessary to provide one of the ½-ton Army trucks known as "blitz buggies." Likewise the decrepit plow, harrow, ash can, or kitchen sink can become part of a tank, battleship, gun, or bomb-casing.

When Is Iron Steel?

While harvesting scrap, many will wonder how such junk and wreckage can be necessary to the sleek, powerful weapons of war, or whether steel might not be better if made directly from iron ore without a mixture of scrap.

Steel scrap, unlike many other things that suffer from being "warmed over," deteriorates hardly at all if "reclaimed" or reworked. After it is melted and cooled, it becomes almost as good as new steel.

Scrap is necessary because it makes possible a short cut that the steel industry of the U. S. has been depending on. Scrap steel is ready-made steel. If you can start with 10 tons of scrap, you need to manufacture only 10 tons of new steel, in order to have 20 tons of finished product; therein lies the saving.

Steel, remember, is just "hard-boiled," "highly flavored" iron. When pure, iron is soft enough to bend easily. To be hardened into steel, it must be strengthened by the addition of carbon and other alloys such as manganese, nickel, and chromium. A young industry, starting with iron ore but no scrap, smelts ore, limestone and coke in tall blast furnaces and produces "pigs," molded oblongs weighing up to 100 pounds apiece. Then the pig iron is melted and "burned" in an open-hearth furnace, with assorted alloys, to make steel.

Scrap's Contribution Is Economy

Pig iron contains a considerable amount of carbon—from 2 to 3½ per cent. Melt the pig iron and burn out the carbon to somewhat less than 2 per cent, and you have steel. But this must be done with care, for just the right amount of carbon—no more and no less—makes iron into steel, with its great strength and its ability to be tempered. Burn out all the carbon and the result would be iron again—pure iron this time, a relatively soft, bendable metal.

The U. S. steel industry is now "middle-aged," old enough to have furnished the material for great quantities of automobiles, machines, and other steel products now broken down into scrap. It has learned to substitute the ready-made steel of scrap metal in its open-hearth furnaces for part of the pig iron. The usual proportion is half pig iron and half scrap.

The steel industry has allowed its middle age to shape it. Ordinarily, an infant

UMI

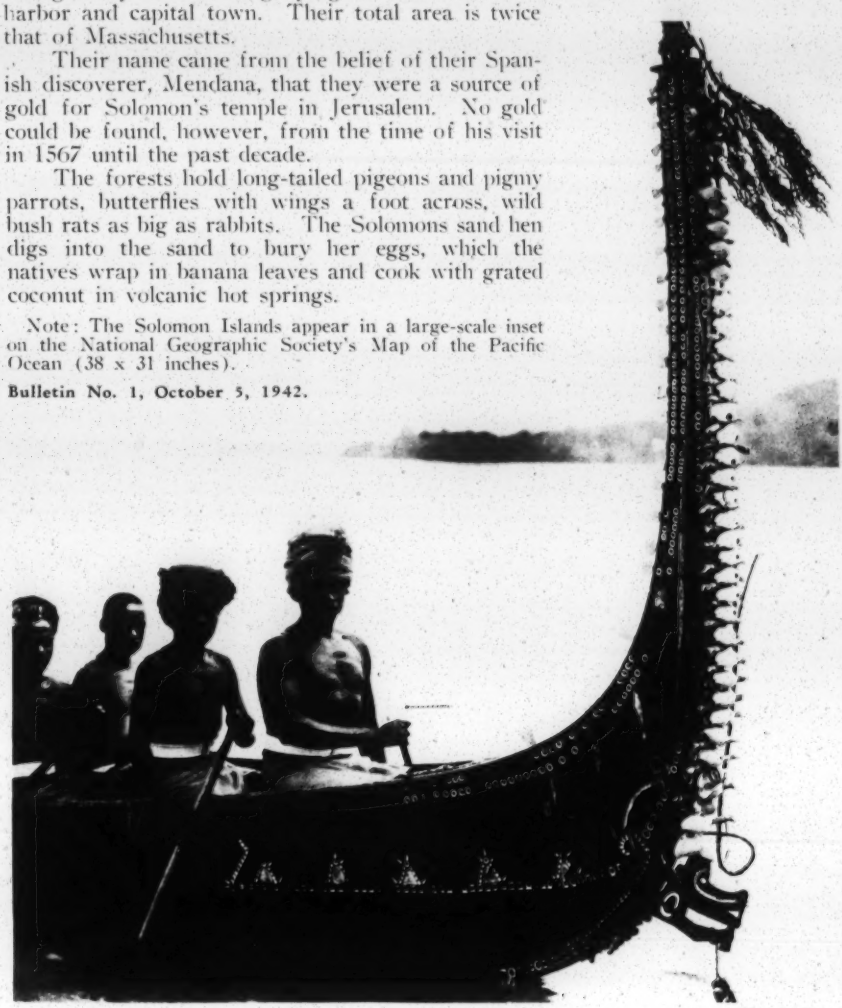
for two centuries. Its active volcano, Mt. Balbi, is 10,171 feet high. Mountainous Guadalcanal is second in size, a rugged island as large as Delaware, where jungles have been cleared for 15,000 acres of coconuts. On its level stretches U. S. Marines have just completed an airfield for large bombing planes. Thickly populated Malaita, eagle-haunted San Cristobal, palmy Santa Isabel, New Georgia, Choiseul, Rennel, Kolombangara, and Vella Lavella are the other sizable islands. Small Tulagi, only 2 miles long, lying between Guadalcanal and Malaita, has the chief harbor and capital town. Their total area is twice that of Massachusetts.

Their name came from the belief of their Spanish discoverer, Mendana, that they were a source of gold for Solomon's temple in Jerusalem. No gold could be found, however, from the time of his visit in 1567 until the past decade.

The forests hold long-tailed pigeons and pigmy parrots, butterflies with wings a foot across, wild bush rats as big as rabbits. The Solomons sand hen digs into the sand to bury her eggs, which the natives wrap in banana leaves and cook with grated coconut in volcanic hot springs.

Note: The Solomon Islands appear in a large-scale inset on the National Geographic Society's Map of the Pacific Ocean (38 x 31 inches).

Bulletin No. 1, October 5, 1942.



Merl La Voy

THE SOLOMONS WAR CANOE HAS A WOODEN FACE TO WATCH WHERE IT GOES

The islanders steam hardwood planks into a carefully bent shape, cement them together with a tree-gum that resembles tar, and make a slim canoe as graceful as a Venetian gondola. Inlays of pearl shell in geometric design, garlands of dyed grass tassels, and a handsome column of whole shells adorn the tall prow. Near the water line the face of the tribe's protecting animal deity, possibly the crocodile, keeps on the watch for rocks and reefs. The light, short paddles are often whittled to a point so that they can serve as weapons. A fresh red hibiscus blossom in turban or hair is the islanders' substitute for the white man's clean collar. Most of the islanders are dark-skinned Melanesians (from Greek *melas* meaning "black"), but several islands are peopled by the Polynesian race, akin to Hawaiians.

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

(A series of bulletins similar to this, with illustrations and full-page map, will shortly be presented on the countries of Latin America.)

Egypt: An Innocent Bystander Embroiled

EGYPT'S 16 million people did not declare war, nor did any other nation declare war on them. But they now find that their country is one of the decisive battlefields of the present war, with British and Nazi forces slowly turning the western reaches into a graveyard.

Occupying the northeast corner of Africa, where the great southern continent hinges onto Asia, Egypt has rarely been able to dodge the wars of northern neighbors. Alexander the Great came over from Greece to found Alexandria in 332 B. C. Caesar paraded the pomp of Rome before daredevil Queen Cleopatra in 48 B. C. Napoleon followed in their footsteps to the pyramids in 1799. For the first time in more than 2,000 years, Egypt became free in 1936, when a treaty with Britain, her former ruler, acknowledged the land of the Pharaohs as independent: Britain reserved the right to station military and naval forces there.

96 Per Cent Desert, Egypt Surpasses U. S. Cotton Acre-Yield

From afar, Egypt is often thought of as a dried-up chip on Africa's shoulder, rainless and barren, with a mummy under every sand dune and a towering pyramid behind every camel. But the industrious brown fellahin, as the Egyptian peasants are called, cultivate 2 million acres of cotton for a yearly yield of as much as a billion pounds (equal to about 2 million American bales). Their average is well above 400 pounds an acre for this leading commercial crop, almost twice the acre-yield in the United States. In addition, they raise 3 billion pounds of wheat—a reminder of Egypt's granary, coveted by Caesar and visited by Joseph and his brethren in Biblical days.

Yet less than 4 per cent of the country is cultivated, some 14,000 out of 383,000 square miles, the latter an area almost twice as large as that of France. For Egypt has been, since the Stone Age, about 96 per cent desert—rising to rocky barren mountains toward the Red Sea in the east, stretching in a barren parched plateau over the Libian Desert into the Sahara in the west. Out in these desert reaches, a series of high, crescent-shaped sand dunes creep forward about 50 feet a year, burying everything in their path. The Mediterranean supplies moisture for scrubby vegetation along the coast, but rain inland is almost unknown.

The Nile Fathered Geometry

The flowering of Egypt is the work of the Nile. Through this lifegiving river the Egyptians, for possibly 15,000 years, have borrowed rain from the cool, well-watered uplands of Ethiopia and the Sudan. By its natural flooding and by irrigation the river creates a fertile border strip 2 to 20 miles wide, from the Aswan cataract to the delta, 490 miles north (map, inside cover). The silt-laden lower Nile served to unite the people of its valley 5,000 years ago into the first great nation in history, through their ability to communicate by river and because of their need to cooperate in irrigation. The security from attack of the Pharaohs' mighty kingdom, and its relative freedom from famine, encouraged the culture that devised the earliest written language yet known, developed mathematics to survey riverside fields, studied astronomy, and laid many other foundation stones

UMI

industry, not old enough to have quantities of broken-down scrap, would make enough pig iron to fill its steel-making open-hearth furnaces. In the U. S., however, existing blast furnaces have less capacity than the numerous open-hearth furnaces built to use a combination of pig iron and scrap. If scrap were not available in the U. S., and if all steel had to be made from pig iron alone, at least 74 new blast furnaces, with a daily capacity of 1,000 tons each, would have to be built to turn iron ore into pigs. They would cost more than a half-billion dollars.

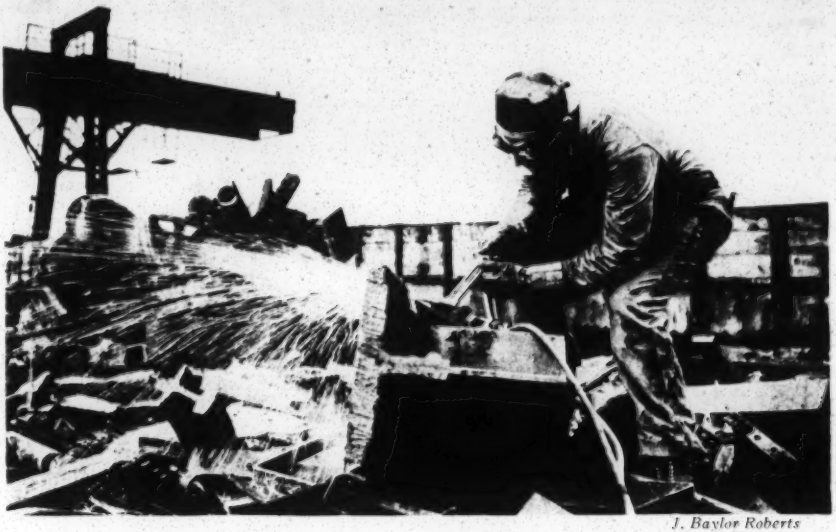
Ordinarily the steel industry counts on obtaining 25 million tons of scrap yearly from the scrap collection industry. In addition, there is a supply of 30 million or more tons of "home scrap," picked up within the steel mills themselves.

The reason for using scrap metal in making steel is economy—economy of time, money, transportation, and man-power. Pig iron costs more per ton than scrap. It takes longer to convert pig iron into steel because of the excess amounts of necessary carbon, and the impurities—sulphur, phosphorus, and other substances—that must be reduced or burnt out completely in making new steel. This "reduction" has already been made in the case of scrap. A possible remedy for the current shortage is sponge iron, made by an old process now being revived.

The economy of using scrap shows up at every turn. Every time a ton of old scrap metal is used, more than four tons of iron ore, coal, limestone, and other natural resources are saved. The 25 million tons of scrap used yearly means a saving of about 45 million tons of iron ore, 30 million tons of coal, and over 12 million tons of limestone. To mine, transport, and convert the ore, limestone, and coal takes men, ships, railroad cars, and time.

Note: For further information about metals in war, see "Metal Sinews of Strength," in the *National Geographic Magazine* for April, 1942. See also: "World's Largest Steel Industry Supplies U. S.," in the GEOGRAPHIC SCHOOL BULLETINS for November 17, 1941.

Bulletin No. 2, October 5, 1942.



J. Baylor Roberts

JUNK BECOMES TREASURE AS 75 KINDS OF PLAIN AND FANCY SCRAP

Honored fighters on the home front are the Junk Brigade, the trained men who collect and classify scrap. The average junk pile of metals must be sorted and graded into 75 or more classifications, each with its special use when reclaimed by the steel industry as a quick substitute for pig iron. In a modern automobile alone, for example, there are some 125 grades of iron and steel. Scrap from special steels, containing such alloys as vanadium, antimony, and chromium, cannot be used as an ingredient for ordinary steel. There is a great demand for experienced men to classify the scrap now being collected. This "burner" is wielding his acetylene torch to strip damaged and discarded railway equipment near Pittsburgh, separating different grades of scrap from material which the railroads can use again.

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)
General Headquarters, Washington, D. C.

Russian Oil, Magnet of the Caucasus

THE oil that now lures warring Nazi armies to the Caucasus once attracted peaceful religious pilgrims. The natural gas found along with these oil deposits fed mysterious Eternal Flames which Fire Worshipers revered, 3,000 years ago.

The Caspian shores of the Caucasus were headquarters for Fire Worship even before Zoroaster—considered a Caucasus native by many—popularized the ancient Persian religion now called Zoroastrianism. There pilgrims were awed by flames hovering over the cold Caspian waters, burning natural gas bubbling up from the sea bottom. Oil derricks near Baku 70 years ago closed in on the last of the temples where sacred gas fires burned for the pilgrims, mostly Parsees from India.

Apsheron Peninsula One of World's Oiliest Spots

Russia's 1941 flow of oil may have filled as many as 249,000,000 barrels, ranking the U. S. S. R. next to the United States as the world's second largest "filling station." Between 80 and 85 per cent of it appears to have come from the Caucasus. Exact production figures are a military secret.

Once 97 per cent of all Tsarist Russia's oil welled up in Baku fields, but for greater safety from invaders the Soviets drilled wells farther east and so made the Caucasus output a smaller percentage of Russia's total. Caucasian oil is valued for the anti-knock qualities of its gasoline and for the lubricants it contains.

Baku means "oil" in the headlines, but there are no wells of importance actually in Baku. This ancient Caspian seaport, now Russia's fifth largest city (809,000 inhabitants), is the shipping and refinery headquarters for oil fields of the Apsheron Peninsula on which it stands. For its area, 400 square miles, this peninsula is one of the most oil-gushing spots in the world. It is a low, sandy finger reaching into the Caspian, at the easternmost extension of the Caucasus. Stalin once worked in Baku's oil industry.

Armenian Genius Made Grozny a Little Baku

Countless derricks rise around Baku on the peninsula in such fields as Balakhani, 5 miles north; Surakhani, 7 miles east; Sabunchi, 6 miles east; and Bibi Eibat, 5 miles south, one of the oldest and richest. Crowded to standing-room-only, more derricks rise on islands and offshore knee-deep in the Caspian. Apsheron wells yield between 160 and 175 million barrels a year. They all pipe oil into the refineries that make Baku's industrial Black Town black. The refineries are supplemented by oil-cracking plants and factories making drilling equipment. Women share in Baku's industry, even operating oil fields as engineers.

Another oil field has been developed on the Shiraki Steppe, a sun-baked semi-desert southeast of Tiflis, Georgia's capital.

Russia's first modern oil well, drilled with machinery instead of hand-dug, was opened in the 1860's, north of the snow-capped Caucasus Mountains in the Kuban area at Kudako, to the amazement of the Kuban Cossacks. In the North Caucasus now, however, it is Grozny that is outstanding for petroleum. An uneducated Armenian workman ferreted out the secrets of Baku's foreign-owned refinery in the 1860's and promoted the first refinery for Grozny. Now this city shares with Baku the bulk of Russia's refineries and oil-cracking plants. Grozny fields produce nearly half as much as all the rest of Europe's non-Russian wells.

Some 300 miles northwest, Maikop's wells yield half to two-thirds as much

UMI

for the structure of man's present knowledge. The Pharaohs may be said to have invented the "blitz" when their chariots attacked infantry (illustration, below).

All the river deltas in the world are named after the Nile Delta, which is *the* Delta. The word came into use because the triangular piece of land at the mouths of the Nile resembled the wedge-shaped Greek letter "d," called "delta." Some 100 miles long and 80 miles wide, the incredibly fertile Delta produces most of Egypt's wealth, thanks to an irrigation system including dams (barrages), reservoirs, and diversion channels galore. Most of the farmers, around 60 per cent of the whole population, cultivate less than one acre apiece. They obtain three crops a year by their year-round conservation of irrigation water.

Cairo, with a million and a third people, stands on the right bank of the Nile, just upstream from the point where the river divides into the two main Delta mouths—the Damietta (eastern) and Rosetta (western) Niles. In addition to being the capital of Egypt and home of young King Faruk, the city is a Moslem center. About 92 per cent of the Egyptians are followers of Mohammed.

Port Said, commanding the northern end of the Suez Canal, lies about 30 miles east of the Damietta Nile's mouth, while Alexandria is an equal distance west of the Rosetta Nile's mouth.

Note: For further information about Egypt see the following articles in the *National Geographic Magazine:* "War Meets Peace in Egypt," April, 1942; "Daily Life in Ancient Egypt," October, 1941*; "Old-New Battlegrounds of Egypt and Libia," December, 1940*; "By Felucca Down the Nile," April, 1940*; and see also in the GEOGRAPHIC SCHOOL BULLETINS: "Nile Delta Is Egypt's Doormat," November 10, 1941.

Issues marked by an asterisk are included in the special list of *National Geographic Magazines* available at 10¢ each in groups of 10.

Separate color sheets of the paintings from the article, "Daily Life in Ancient Egypt," are available in packets of 96 sheets for 50¢ or 48 sheets for 30¢.

Bulletin No. 3, October 5, 1942.

From a painting by H. M. Herget

EGYPT'S B. C. DESERT BLITZ MOVED BY HORSEPOWER

Modern tanks in their plunge across the sands of Egypt had their forerunners in war chariots which King Thut-mose III led against the Syrians in 1478 B. C. Wearing the high war helmet—the Blue Crown—and a leather corselet overlaid with gold, this conqueror of eastern Mediterranean lands is shown on the plain of Esdraelon leading his chariot division to capture the fortified city of Har Megiddo—a battle which gave to modern military commentators the term Armageddon for any place of great slaughter.

GEOGRAPHIC SCHOOL BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Geo-Graphic Brevities

AMERICANS HELPED BUILD STALINGRAD, KEY CITY OF THE VOLGA

THE intensity of Russia's prolonged defense of Stalingrad against Nazi assault is a sign of the importance of this city on the west bank of the Volga, less than 50 miles east of the great loop of the Don River. This has been one of the leading industrial centers of the Soviet Union. The city's 31-mile river front was given over to such assorted work as building ships, refining oil, canning, making tractors, processing metals, and milling timber. The name means "Steel City."

For the vast farms of Russia it has specialized in building tractors. Its first huge plant, completed in 1931 with an annual capacity of 50,000 tractors, was built with the aid of American engineers and workers. At the approach of war, the city gained the reputation of being Russia's No. 1 source for tanks.

With its important position on the Volga River artery, the city overlooks essential war traffic between the ports of the Caspian Sea and the vast inland regions east of Moscow. On the river highway to the north stand such active nerve centers of Russian defense as machine-making Saratov; the outpost secondary capital, Kuibyshev; and Kazan, where synthetic rubber is produced.

Sloping from the Don eastward to the Volga, the flat area west of the city offered few natural obstructions to help Stalingrad's defense. The whole course of the Volga south of the city is through land below sea level.

The Russians prize Stalingrad as one of the first cities developed under their five-year plans for building national industries. Situated, on one hand, in a farm region needing modern equipment, and having, on the other hand, access to extensive coal and iron deposits of the Don basin, the city became a pioneer in the production of agricultural machinery. In 1926 it had only about 151,000 inhabitants; by 1939 the population was more than 445,000.

* * * * *

DIEPPE WAS GEOGRAPHY PROBLEM FOR COMMANDOS

THE 9-hour battle of the Commando raid on Dieppe, hailed as a dress rehearsal for invasion, took place on unusual terrain.

The white cliffs of Normandy rise sheer and steep from the English Channel. At their base stretches a rocky shelf of beach, dry at low tide, rarely wider than 200 yards. To invasion forces such a formation is threatening because defenders on the bluffs above can fire easily on landing parties. At several landings east and west of Dieppe the Commandos had to overcome this handicap.

But at Dieppe the Arques River estuary makes a break in the chalk cliffs, providing the city with an extraordinary harbor and creating a possible entrance for attackers. The narrow entrance leads first to an outer, 16-acre harbor, and then to an inner port with an area of 10 acres. Early Norman settlers named it Diep because of its deep, sheltered position.

The port, with a population of 25,000, has seen history made since Roman times. It was an important French naval base during the 17th-century wars against England, Spain, and the Netherlands for control of the seas. During the Franco-Prussian War of 1870 it was occupied by the Germans.

Near Dieppe fogs are so common, especially in summer, that the land in some sections is almost never clear of mist. These can afford concealment to invaders.

UMI

as Grozny's. To the east in Daghestan, smaller oil deposits dot the Caspian shore northward to Makhach Kala, Daghestan's capital. In 1940, these three chief North Caucasus fields poured forth between 28 million and 36 million barrels.

For twenty years after the birth of the U. S. oil industry in 1859, American kerosene outsold Russian oil in Russia because of lower cost and higher quality.

Germans helped launch the modern oil industry in Russia. Baron Tornau built the first refinery near Baku in 1858, beside a Fire Worshipers' temple, to extract "photogen," or kerosene, from the oil. Wells were then being dug by hand, and petroleum in leather bags was hoisted by rope and pulley and horsepower. The bags sloshed to Baku, hung under high wooden carts with wheels six feet across.

An advocate of peace—also the inventor of dynamite—helped develop the industry that makes the Caucasus a target of modern war. Alfred Nobel, whose Nobel Peace Prize and other awards further the peaceful arts, founded an oil company that laid the first pipe line and ran the first tank steamer out of Baku.

The 1870's saw drilling machinery introduced, with Americans as supervisors and super-American "gushers" as results. The famous Droozhba gusher of Bibi Eibat in 1896 rained oil on Baku five miles away, and turned valleys into dark lakes that gradually overflowed in oily black rivers pouring across the sandy landscape to the sea. This petroleum geyser was estimated to be spouting more oil than all U. S. wells together, plus all other wells of Europe.

Note: The Caucasus, including the oil pipelines, is shown on the National Geographic Society's Map of the Theater of War in Europe, Africa, and Western Asia, which was issued as a supplement to the July, 1942, *National Geographic Magazine*. A price list of maps may be obtained from the Society's headquarters in Washington, D. C.

For further information about the Caucasus, see "Roaming Russia's Caucasus," in the *National Geographic Magazine* for July, 1942; and "Russia's Rich Oil Reserves," in the GEOGRAPHIC SCHOOL BULLETINS, December 8, 1941.

Bulletin No. 4, October 5, 1942.

Sovfoto

BAKU'S OIL ABUNDANCE GOES SPECIAL DELIVERY TO MEET CASPIAN SHIPS

Two low-lying tankers, one named Balakhani after the rich oil field north of Baku (right), have sailed northward from Baku to anchor in the Caspian Sea where steamers pass after leaving the mouth of the Volga. The seagoing filling stations then supply fuel to the south-bound ships, which have purposely started their voyages with a minimum of fuel. Thus the anchored tankers save unnecessary transportation; otherwise they would have to carry oil up the Volga to Astrakhan for ships to refuel there. The oil of Baku has been in demand since Marco Polo's days. This 13th century globe-trotter saw it carried in skin bags loaded on camels to light the clay and alabaster lamps of Persia. Caucasians used the oil for fuel and light, for greasing harness and cart wheels, and for medicine.

Several miles west of Dieppe, the little Scie River also breaks through the cliffs near Pourville, where British and Canadian raiders made flanking landings.

* * * * *

CORNWALL'S TIN "PIXIES" TO HELP UNITED NATIONS

THE WAR may bring back the "pixies" to the English coast of Cornwall—those tin miners who once worked in pits along the shore. Their tiny figures, magically appearing and disappearing at the rim of tin diggings, reminded observers of the mysterious little creatures of fairy tales.

There is no mystery about the war need which has led Britain to reopen ancient Cornish mines. Cornwall in 1940 produced about 1,800 tons of tin—a small amount compared with the 130,000 tons from British Malaya and the Netherlands Indies in the same year. Other substantial supplies of tin lie far overseas in South American Bolivia and African Nigeria.

Cornwall, in the southwest corner of England, was one of the world's earliest sources of tin. The deposits are around the mining settlements of Camborne and Redruth, toward the western end of Cornwall. In sharp contrast to the Bolivian tin mines on the "roof of the world," some of the Cornish mines are tunneled under the floor of the sea (illustration, below).

Deposits have been worked there since the Bronze Age when tin and copper alloys were made into sharp-edged tools. Later, Roman invaders found Cornish tin valuable in arming for other conquests. Peak of the Cornish tin industry came around the 1870's. After that, diminishing output and higher cost of extraction, due to deepening mine excavations, made competition difficult against the rising Far East sources. By 1930 most of the Cornish mines had shut down.

Planet News Ltd. from Acme

SUBMARINE MINES OFF CORNWALL PRODUCED SOME OF THE PIXIE TIN

Early tin diggings along Cornwall's coast, the oldest worked mines known to history, were often shallow pits. Later the mines had to be extended to deeper levels, some of them tunnelling under the sea. Along with the tin ore occur other valuable minerals, including copper, lead, zinc, tungsten, nickel, and small quantities of uranium (from which radium can be extracted). In the Middle Ages, tin coins circulated in Cornwall.

UMI